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AIRCREW TRAINING EVALUATION: B-52 AND KC-135 FORMAL SCHOOL TRAINING

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This report has been reviewed and is approved for publication.

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This report documents a descriptive and analytical investigation of the training information and evaluation system which supports the initial qualification, pilot/navigator-upgrade, and requalification training programs for B-52 and KC-135 aircrews at the 93 Bombardment Wing (BMW), Castle AFB, California. The rationale for the study was that improvements in aircrew training evaluation must be based upon an adequate understanding of current practice. A description of the training information system is organized according to the temporal sequence in which information is collected, and according to the offices in which information is collected and processed. It was concluded that sufficient data are gathered for the evaluation of students as they progress through the program of instruction, yet little of this information is used, in turn, for systematic evaluation of the training system. The limitations of the present information and evaluation system were interpreted as a function of past Air Force requirements for evaluation, a manual record keeping system, parallel evaluation functions performed by several of the offices within the Wing, and the absence of an overall integrated evaluation plan.

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SUMMARY

A descriptive and analytical investigation of the training information and evaluation system which supports initial qualification, pilot/navigator-upgrade, and requalification training for B-52 and KC-135 aircrews at the 93 Bombardment Wing, Castle AFB, California, was conducted. The study was envisaged as a baseline from which to develop eventual improvements to evaluation practice. A description of the organization and functioning of the information and evaluation system is presented, along with a synopsis of the system which is grouped according to the informational categories of student evaluation, program evaluation, and management of student instruction. It was concluded that ample provisions exist for evaluating students as they progress through the program of instruction, yet most of this information is not used, in turn, for systematic training program evaluation. The limitations of the current information and evaluation system were viewed as a function of past Air Force requirements for evaluation, the current manual information system which renders routine information collection and analysis impractical, parallel evaluation functions being performed by several offices within the Wing, and the need for an overall, integrated evaluation plan.

PREFACE

This work was performed in support of AFHRL Work Unit No. 1123-03-83, Flying Training Research Support. The report documents current evaluation practices in formal school training for B-52 and KC-135 aircrews. The study is part of a larger effort in which evaluation for all phases of B-52 and KC-135 training is described in order to provide a baseline from which to design improvements to the evaluation of aircrew training. This author wishes to acknowledge the contributions of several individuals. Dr. Robert Nullmeyer, AFHRL/OT, first suggested the need for a study of current aircrew training evaluation and provided helpful comments as the paper was being drafted. Separate reviews of a draft manuscript were also provided by Dr. Marty Rockway, UDRI; Dr. Thomas Killion, AFHRL/OT; and Majs Charles Wennermark and Stewart Monti, 93 BMW/DO5. This author accepts, however, sole responsibility for the conclusions contained in the report. Most importantly, this author wishes to extend a note of thanks to the men and women of the 93 Bombardment Wing, who graciously consented to interviews about their training information system and made numerous documents and other materials readily available.

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AIRCREW TRAINING EVALUATION:
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I. INTRODUCTION

This report documents a descriptive and analytical investigation of the information system which supports the initial qualification, pilot/navigator-upgrade, and requalification training programs for B-52 and KC-135 aircrews at the 93 Bombardment Wing (BMW), Castle Air Force Base, California. The current version of the information system is largely a manual form of record keeping, which provides data used in the management and evaluation of the aircrew training programs. While both of these functions are addressed in the present study, evaluation is of primary interest.

Several recent developments are likely to increase future requirements for the evaluation of aircrew training systems, or at least make evaluation more visible. For example, Department of Defense Directive No. 1430.13, Training Simulators and Devices (Office of Secretary of Defense, 22 August 1986) specifies that training effectiveness evaluations are to be conducted to ensure that training devices meet training requirements and effectiveness levels. A trend toward contracted aircrew training--with C-5, E-3A, KC-10, and C-130 providing examples--also accentuates the importance of evaluation, since organizations other than the military are conducting large portions of the training. Compliance with contractual requirements is a relevant evaluative issue in contracted aircrew training. The importance of a comprehensive evaluation of training was recognized early in the C-130 program, and this led to the formulation of a test and evaluation plan during the front-end analysis (see Fishburne, Williams, Chatt, & Spears, 1987, pp. 29-40; Spears, 1986) and the subsequent requirement for a training system test and evaluation plan in the Statement of Work for the C-130 Aircrew Training System (Aeronautical Systems Division, 1 June 1986).

Economic constraints produce additional pressures to conduct evaluations of training, as competing demands are placed on limited budgets. Accordingly, formal demonstrations of effectiveness are especially critical with respect to expensive program resources such as weapon system trainers and flying hours. In this regard, the General Accounting Office (GAO), in their review of Tactical Air Command (TAC) and Strategic Air Command (SAC) flying hour programs (GAO, 1986), concluded that justification of the flying hour budgets submitted to the Congress had not been based on documented demonstrations that increased flying hours lead to increases in the combat capability of aircrews. The GAO also argued that the relationship between flying hours and combat capability should be based on objective evidence, not judgment alone. More generally, the Defense Science Board (1982) concluded that information to support management decisions in military training is sparse.

Collectively, these factors suggest that evaluation of aircrew training is a serious concern, and that it must be practiced in a formal, systematic fashion. Only this approach to evaluation is capable of satisfying the increasingly stringent requirements for information concerning the effectiveness of complex training systems, including expensive components such as weapon system trainers and flying hours. This is, indeed, the perspective adopted in the present study. In this regard, it is noteworthy that credible

evaluations demonstrating the effectiveness of programs in other settings have often resulted in the maintenance of those programs; in some cases, they have resulted in program expansions--even in times of scarce monetary resources (Wholey, 1986). The objective, then, is to make aircrew training evaluation more responsive to the requirements imposed upon it.

In a fundamental sense, to determine that a program or training regimen is effective requires an assessment of outcomes; a program is judged effective to the extent that desired outcomes are actually attained (Patton, 1986, p. 345; Scriven, 1982, p. 48). In aircrew training, such outcomes typically include measures of aircrew learning and performance. It is often necessary, however, to understand why or how a program is effective or ineffective; for this, a separate evaluation is required. This evaluation has been termed a "process evaluation" (Judd, 1987; Patton, 1986; Scriven, 1982, p. 121). Process evaluations provide detailed knowledge about program implementation and operations, and unintended effects are often detected from them. Information from process evaluations is important, particularly if one wishes to improve program effectiveness. Some evaluators have argued that program improvement is the most important function of evaluation (Cronbach, 1963, 1982; Stufflebeam, 1985). Recently, evaluators have prudently suggested that process and outcome evaluations be combined in assessments of programs (Cronbach, 1982; Judd, 1987), although the past tendency has been to focus on outcomes alone.

These basic types of evaluation, if conducted on a routine basis, should provide much of the necessary information from which to determine the effectiveness and efficiency of aircrew training. If used properly, they should also furnish information from which to improve training and justify particular uses of training resources. A review of selected B-52 and KC-135 operational training programs suggests, however, that evaluation is focused primarily on the performance of individuals or aircrews, not necessarily on the effectiveness and efficiency of training (Bruce, Rockway, Povenmire, & Killion, in preparation). A similar conclusion was asserted in a recent review of performance measurement requirements in TAC training (Waag, Pierce, & Fessler, 1987). This emphasis is easily understood in the context of the military, as it is individuals and aircrews which must ultimately perform combat missions, and information which assists in making judgments of their capabilities is vital. Yet, this emphasis may also lead to the neglect of evaluating important aspects of the training system, the means by which combat-capable aircrews are produced.

The findings of Bruce et al. (in preparation) and Waag et al. (1987) serve to illustrate that evaluation can have multiple focuses. Evaluating selected aspects of a training system can be construed as a form of contingency management; using information to monitor the performance of a feature of the training system may actually increase the likelihood that training will be responsive in prescribed ways (Bruce, Nullmeyer, & Rockway, 1987). For example, if it is important that a training system be rapidly updated because of changes in the aircraft mission or equipment, an informational mechanism can be developed which targets ongoing and projected changes, how changes were implemented, and the amount of time to complete actual changes to the training system. Such a method would likely increase the probability that the training system would incorporate needed changes relatively quickly. It is prudent, therefore, to specify as comprehensively as possible the critical focuses of

an evaluation, which may include program recipients, resources, and training strategies. A related point is: Just as evaluation has multiple focuses, the same information can serve multiple functions. For instance, performance assessments of individuals can often be aggregated and analyzed in diverse ways to provide information about program outcomes. These considerations are intended to serve as important background elements as we now examine information collection and use at the 93 BMW.

II. OBJECTIVES

The present investigation is part of a larger effort in aircrew training evaluation, which will include an examination of information collection and evaluation practice in initial qualification, mission qualification, and continuation training for B-52 and KC-135 aircrews. The reason for the study was simple: Improvements in aircrew training evaluation must be based upon an adequate understanding of current practice. Accordingly, this work is intended to serve as a baseline for devising eventual improvements in aircrew training evaluation within a formal school setting of SAC. The objectives of the effort were: (a) to identify the main items of information collected on students as they progress through the initial qualification, pilot/navigator-upgrade, and requalification phases of training; (b) to identify additional information which is collected for evaluation and improvement of the programs; (c) to identify relevant data collected for the management of student instruction and the operation of the training system; (d) to determine how collected information is actually used; (e) to identify shortfalls in the evaluation process; and (f) to suggest some initial improvements to evaluation practice, within the constraints of the current information system. This investigation does not include the formulation of a comprehensive information and evaluation system for the 93 BMW, as that would involve a more extensive development process. It is considered, however, as a first step in that endeavor.

III. METHODS OF INFORMATION COLLECTION

Interviews were conducted with 33 individuals from the following Wing offices: 329 Combat Crew Training School (CCTS), the 93 Air Refueling Squadron (AREFS), the 328 Bombardment Squadron (BMS), the Standardization/Evaluation Division (DOVB/K), B-52 and KC-135 Training Program Management (DO2B/K), the Operations Systems Management Branch (DOTF), the Instructional Systems Development Branch (DO5), and Wing Scheduling (DOT). Individuals interviewed included training managers, curriculum developers and evaluators, Wing evaluators, academic-training section heads and the Director of Academics, flying-squadron operations officers and flight commanders, Wing schedulers, and clerical personnel. The interviews were structured to identify all training information collection, use, and dissemination. Follow-up interviews were conducted by telephone or in person with different personnel, to verify training database inputs and gather additional information about the structure and functioning of the system. Samples of all data forms and charts were obtained from each office for examination. A Mission Review Panel was attended to observe how flying training events were documented and verified, and to identify interfaces with other components of the aircrew training system such as scheduling and maintenance.

Samples of the following reports were reviewed: CCTS Graduate Summaries prepared by DO2B/K, which include Standardization/Evaluation (S/E) results and analyses; reports of needs-analysis visits, as specified in AFR 50-38 and SACR 55-70; Curriculum Review Group (CRG) and Curriculum Review Board (CRB) minutes; and Training Review Panel (TRP) reports. These were examined to determine what training information is routinely reported, reviewed, and acted upon, and then disseminated within and outside the Wing. Several CRG and CRB meetings had been attended on previous occasions.

Applicable regulations, manuals, pamphlets, and operating instructions were identified to assist in describing and understanding the 93 BMW training information system. In addition, a current organizational chart, Deputy Commander for Operations, was used to identify organizational components of the training system and the chain of command.

IV. INFORMATION SYSTEM DESCRIPTION

The results of this inquiry are organized along two dimensions. First, each office within the 93 BMW which collects, processes, and uses training information is listed, and the information collected and used in each of them is then described. Second, there is an attempt to preserve the temporal sequence of information collection. For example, Flight Records (DOTF) receives training information from Air Training Command (ATC) directly, or this information is hand-carried to the 93 BMW by the incoming student. This is considered the first informational input into the aircrew training database. As students progress through the training curriculum, the academic and flying squadrons collect training information, in sequence. Eventually, graduates and gaining-unit squadron commanders return external evaluation questionnaires, the last item of information in the temporal sequence, to the 93 BMW.

The CRG, CRB, and TRP are formal bodies within the 93 BMW which review programs and make decisions. The information which is passed up through the chain of command and typically reviewed by these bodies is also presented. In addition, information which is disseminated outside the 93 BMW is described.

Systems of Record Keeping

Five systems of student record keeping were identified: Personnel Records (329 CCTS/DA), Flight Records (DOTF), Training Records (329 CCTS, 93 AREFS, and 328 BMS), Standardization/Evaluation Records (DOV3/K), and External Evaluation Records (DO5). Personnel records will not be treated in this report. Some interfaces between record keeping systems will be identified below.

Operations Systems Management Branch, or Flight Records (DOTF)

Student records arriving from Undergraduate Pilot Training (UPT) or Undergraduate Navigator Training (UNT) are first processed at DOTF. The Flight Record Folders and Flight Evaluation Folders from UPT and UNT are kept on file until the students complete the CCTS training program. These folders

are also retained in DUTF for those students undergoing upgrade and requalification training. Flight Record Folders contain the Individual Flying Record and the Flying History Report. The Individual Flying Record contains a running history of flying hours by sortie, and each sortie is separated according to the type of aircraft. The Flying History Report contains flying hour totals for each aircraft in a given duty position, and it includes career totals for all flying, including simulators. Flight Evaluation Folders contain AF Form 8, Certificate of Aircrew Qualification; ATC Form 1122, Summary Performance Report, which is a brief descriptive summary of performance; and ATC Form 240-5, Summary Record of Training, which contains courses, hours, and grades in each course. These records are available for examination by all training squadrons, but they are not routinely used by all instructor personnel. Some academic sections have made independent arrangements with UPT and UNT to obtain copies of these records, but they are not received on a reliable basis.

Crew Mission Accomplishment Reports (MARs) are completed at the conclusion of each sortie for student crews and permanent party crews (e.g., Wing instructor/evaluator crews and all crews from the 924 AREFS). Crew MARs are used primarily for tracking fuel consumption, flying time, and number of sorties scheduled/flown. Individual MARs are completed for permanent party personnel only. Individual MARs are not completed for students undergoing initial qualification training, as these students are not yet qualified in their primary aircraft. Individual MARs are also not completed for upgrade or requalification students. After verification in Mission Review Panel, all MARs are entered into the Air Force Operational Resource Management System (AFORMS) computer, but only permanent-party individual MARs which record flying events accomplished are actually tracked in this system. Flying events accomplished by those undergoing training in the initial qualification program are not tracked by AFORMS, but their total flying time logged in the aircraft is tracked by this system.

329 Combat Crew Training School

Academic sections are organized according to crew position, such as pilot/copilot and navigator, for both the B-52 and the KC-135. Although there is some variation between the academic sections in the specific items of information recorded as students progress through instruction, there are some general trends. Each section records examination scores on a separate form for each student. The Appendix to the present report contains an example of one such form, the Initial Qualification Criterion Test Record, which is used in B-52 pilot academics (see Appendix, p. 28). Scores may be expressed as pass-fail or percentage correct. End-of-course examination scores are also recorded on these forms. In addition, each section records accomplishments and/or performance ratings for each session with aircrew training devices. Some sections record the amount of time each student spends on each unit of instruction and the date of completion.

Data on student learning and performance are used for the day-to-day management of instruction and the evaluation and tracking of each student's progress. These data may also be used for within-section program monitoring. They are not processed, analyzed, and disseminated for routine evaluation of the academic program. They remain in section files at the 329 CCTS after

instruction is completed. Records are retained from 6 months to 3 years, depending on the section.

At the conclusion of academic instruction, each student completes an evaluation on Castle Form 49, CCTS Student Critique: Academics Phase[1] (see Appendix, p. 29). Students are requested to rate instructors, individual assistance, training methods, training literature, visual aids, synthetic training aids (aircrew training devices), examinations, and the overall course. The ratings are either outstanding, satisfactory, or unsatisfactory; and comments or recommendations for improvement are to be provided if an area has been rated unsatisfactory. In essence, this information is concerned with the processes of instruction; for example, whether instructors were understandable and helpful, the usefulness of visual aids, the understandability of examinations, and the use of training time. Course critiques are typically circulated within each academic section for review and/or action by instructors and section heads.

All course critiques are forwarded to the Director of Academics for "recapitulation," and the results are summarized by class. The recapitulations contain the overall frequencies of outstanding, satisfactory, and unsatisfactory ratings for each of the categories listed above, and critique items are also enumerated by category. The recapitulation is disseminated to every major training section within the 93 BMW for review, comment, and/or action. Appropriate training managers throughout the Wing must respond to unfavorable critique items. This process appears to serve as a check on unwarranted student comments or a means of corroborating deficiencies which must then be corrected.

At the completion of academic instruction, each student is assigned distinguished graduate (DG) points, and Castle Form 219, Education/Training Report, is completed by the academic instructor. This latter form pertains to general attitude, conduct, and fitness. These items of information are then sent to the flying squadrons. CAFBR 50-5, Section 1.b., states that each academic section will provide a summary of academic training and examination results to the flying squadrons, presumably to assist the flying squadrons in identifying strengths and weaknesses of students. In practice, this does not occur.

328 Bombardment Squadron and 93 Air Refueling Squadron

Each flying squadron constructs training folders which contain records for the flightline phase of instruction for each student. The main items consist of Progress Reports (PRs), one of which is completed for each training session in a weapon system trainer (WST) or aircraft sortie, and the master Training Accomplishment Report (TAR). Training events accomplished during

[1]Student critiques are being revised by the DOS. The new critiques will include an expanded informational format, direct questions with an associated rating scale, and they will be processed by a computer.

flightline instruction are recorded on the TAR. Records are also kept for training received in cockpit procedures trainers (CPTs), T-10s, T-4s, and other aircrew training devices. Some of these records, however, are not contained in the main training folders. Instead, they may be kept in facilities which house particular aircrew training devices.

Instructors enter items of information on the above forms after each instructional session in an aircrew training device or the aircraft. Proficiency ratings are entered on PRs (see Appendix, p. 30) for each repetition of a particular flying event in the WST or aircraft. Proficiency ratings are assigned according to the criteria of a 7-point grading scale in use at the CCTS, which ranges from 1.0-4.0 (including half-points), with 3.0 considered as "initial proficiency." Interestingly, ratings for each accomplished flying event on the PR are not arranged sequentially; rather, the record contains a mere tally of the number of times an event was performed at a given level of proficiency. Accordingly, precise sequential information cannot be derived for tracking student progress. Space is provided on the PR for descriptions, discrepancies, and critiques of student performance. Instructors enter the number of repetitions for each flying event accomplished during each aircraft sortie on the TAR (see Appendix, p. 31). When proficient performance for an event has been achieved by the student, a circle is drawn around the corresponding entries for that particular sortie. Proficiency levels, grades, or training accomplishments are entered for sessions with other aircrew training devices such as T-10s, T-4s, and CPTs.

After each flight, students and instructors verify the training accomplished. The TARs and PRs are also reviewed by flight commanders after each sortie, and the TAR becomes part of the package which is submitted to the Mission Review Panel the day after the flight. If a scheduled training event is not accomplished on a given sortie, Castle Form 144, Student Action Record, is completed. It is forwarded to DO2B/K via Mission Review Panel for action, which may include rescheduling of the particular event(s).

TARs are reviewed by flight commanders prior to each student's last flight before the SACR 60-4 checkride. This is done to ensure that training requirements are completed, or to notify DOTB/DO2B or DOTK/DO2K of incomplete items so that additional training may be scheduled or event waivers obtained. Copies of TARs and PRs are prepared by instructors, and these and the master sets are signed by flight commanders and DO2B or DO2K. These copies are eventually hand-carried by graduates to their gaining units after completion of the CCTS program. Master copies are retained by the flying squadrons for 1 year. CAFBR 50-5 states that if a Follow-On Operational Test and Evaluation (FOT&E) of an aircrew training device is in effect, copies of PRs are to be sent to the FOT&E Test Director at the DO5. The reports are then to be returned to the flying squadrons for retention. TARs and PRs are used only to track event accomplishment and to monitor and evaluate student progress or proficiency throughout the flying phase of training. They are not used to conduct a formal evaluation of flying training.

At the conclusion of the flightline phase of training, students complete Castle Form 55, CCTS Student Critique: Flying Phase (see Appendix, p. 32), which contains the evaluative categories of instructors, flying training, training aids, Standardization/Evaluation Division, and overall evaluation of training. These critiques are reviewed by flight commanders and squadron

operations officers. They are then disseminated for review within the Wing. The DG points are assigned to students by the squadrons, and together with Castle Form 219, they are then forwarded to 329 CCTS/DA for final processing.

Standardization/Evaluation Division (DOVB/K)

All procedures for the S/E program are contained in the SACR 60-4 Volumes. DOVB/K administer written examinations over such content areas as aircraft procedures, aircraft performance data, Air Force and SAC regulations, and emergency procedures. Additional areas may be assessed, depending upon crew position. Some examinations are open-book, while others are closed-book. All examinations must be completed and passed prior to the SACR 60-4 checkride. The examination scores remain on file for 1 year. CPT checks for bomber and tanker pilots, evaluations in celestial training devices for bomber navigators, and T-4 checks for electronic warfare officers are also conducted prior to checkrides. Some of these checks may be conducted by the instructors, instead of DOV personnel.

Tanker and bomber pilots are administered instrument checks as part of their SACR 60-4 evaluation. Pilots are also evaluated using the Fuel Conservation Critique Form. Upon completion of checkrides, DOVB/K personnel fill out AF Form 8, Certificate of Aircrew Qualification (see Appendix, p. 33), for each individual. This form includes the assignment of grades for ground and flight phases of the check. Evaluators also assign a qualification level--Q1, Q2, or Q3--the latter of which corresponds to the unqualified level. DOV Form FL #16, Corrective Training, is completed for those individuals who require corrective training. This form has sections for recording discrepancies and recommended actions. DOV Form FL #20, Notification of Corrective Action, is also used for corrective action but typically refers to ground training. Trends analysis worksheets are completed for each individual after the checkride. Each student is also assigned DG points at the conclusion of all qualification activity.

All AF Form 8s are reviewed by the DOV branch chiefs and sent to the appropriate flight commanders in the flying squadrons for subsequent review. AF Form 8s are then returned to the DOV. Individual AF Form 8s are sent to the graduate's gaining unit. When the graduate arrives at a gaining unit, the Wing DOV arranges for a joint review and signature of the AF Form 8. Checkride results for individuals (CAFB Form 74, Initial Qualification Check Results) and each class (DOV FL #12, Stan Eval Report) are forwarded to DOI/2. CAFB Form 74 includes the qualification level and explanations for less-than-qualified activity. Class results on DOV FL #12 (see Appendix p. 34) are expressed as overall numbers in each qualification category and percentages of students in each. Annual class results which are pooled across classes are also tracked on this form, presumably to provide a baseline for comparison with results of each individual class.

The trends analysis program is designed as a tool for improving the aircrew training program. Negative trends in ground or flying activity may result from observed deficiencies in knowledge or performance, and they may indicate that training requires revision or restructuring. Combined results of individual SACR 60-4 evaluations, the raw data of which appear on the Trends Analysis Worksheet (see Appendix, p. 35), form the basis for trends

analysis within the Wing. Ratings on these worksheets are divided into five different categories. The first four categories correspond to ascending levels of qualification and the fifth indicates that an activity was not observed on a particular check. Examinees are rated in numerous areas of flying activity such as communications, crew coordination, navigation, and air refueling. Trends analysis results are entered into a computer at the DOV, and the performance of each class of students, by crew position, is compared to a cumulative database composed of trends analysis results from previous classes. From these comparisons, trends are detected over time. Deviations below the "norm" are first reported as "areas of interest." If such deviations continue over 2 to 3 classes, they are reported as "trends." Trends require corrective action, but there is no centralized focal point within the organization for confirming the validity and identifying the source of trends, or for ensuring their subsequent diagnosis and correction. Trends are reported at monthly CRG, CRB, and TRP meetings, and action may be taken upon them in these forums. Identified trends may also be the subject(s) of discussion at instructor meetings, at which time they are noted and become the object of "special attention" in subsequent instruction with students. As such, they are acted upon prescriptively, outside the purview of a formalized process of detection, validation, diagnosis, and correction.

Monthly compilations of individual SACR 60-4 evaluations, subdivided according to ground and in-flight areas of activity which are the same as those for trends analysis, are sent to the 1st Combat Evaluation Group, Barksdale AFB, Louisiana, on SAC Form 111, Standardization Data Transcript. These monthly compilations become part of the SAC-DOT(M) 7109 report (see SACR 60-4, Vol. I), and they form the basis for the Command trends analysis program.

DOV is also involved in other evaluative activities. These include no-notice evaluations of classes, trainers, briefings, or critiques, which are recorded on Castle Form 11, Academic Evaluation Worksheet (see Appendix, p. 36) and DOV FL #5, Training Device Evaluation (see Appendix, p. 37). A set percentage of academic courses and trainers are evaluated each year, as specified in SACR 60-4. These evaluations focus on the content of instruction and the presentation of materials by instructors. They also serve as a gauge of program implementation, as one of the targets of evaluation is to determine if instructors have carried out lessons as prescribed. Results are disseminated monthly to the DO, DO5, and WISM. The noted discrepancies and recommendations for corrective actions which result from these evaluations become the responsibility of DO5.

Bomber and Tanker Training Program Management (DO2B/K)

DO2B and DO2K are the training program managers for bombers and tankers, respectively. They work with HQ SAC/DOTP (Training Programs) to build each class, taking into account Command requirements and CCTS capabilities. They also act as CCTS instructor-personnel managers and work to maintain required instructor-force levels. During the flightline phase of training, these managers are responsible for reviewing and acting upon Castle Form 144s, Student Action Record, submitted via the Mission Review Panel meetings. Wing scheduling (DOT) is then notified of any events in which additional training is required, and these events are incorporated into subsequent mission

development. Castle Form 144s are also used by DO2B/K to detect trends in the flying program. For example, more events are waived during the winter months, because of weather conditions, than at other times of the year. The presence of trends may produce changes in training policy.

DO2B and DO2K are also responsible for reviewing and signing TARs prior to solo flights and for obtaining waivers of training events. When TARs are processed at the conclusion of the CCTS program, total sorties and WST sessions are counted for tracking purposes. Students are issued a certificate of flightline course completion (DOT FL #7), which they present to the 329 CCTS, and a Certificate of Training (AF Form 1256) is then issued.

DO2B and DO2K prepare CCTS Graduate Summaries in accordance with SACR 51-52 and SACR 51-135. These summaries include class composition, such as total crews and numbers of graduates at each crew position; sorties scheduled and flown; training events waived; late graduates; and S/E class and individual results. These summaries are typically sent to 8 Air Force (AF) and 15 AF, 12 Air Division (AD), Strategic Air Command Headquarters (HQ SAC), and Air Training Command, as well as some of the major offices within the 93 BMW.

Instructional Systems Development Division (DO5)

The Instructional Systems Development (ISD) Division (DO5) is the focal point for development, revision, and validation of the aircrew training curriculum. This division has a role in the internal evaluation process, and it has exclusive responsibility for the external evaluation program. SACR 55-70 specifies that the DO5 is also responsible for integrating aircrew training devices into the training curriculum and validating this training. DO5S directs and conducts FOT&E for aircrew training devices such as the B-52 and KC-135 WSTs.

Validation is an activity that is integral to the ISD process (AFM 50-2; AFP 50-58, Vol. IV). A formal plan is usually developed for validation efforts at the 93 BMW, but small changes in the curriculum could be incorporated and validated without a formal plan. There is typically a range of indices from which to assess the validity of a particular addition or change to the curriculum. Most often, however, assessments consist of student and instructor questionnaires. A more extensive validation effort for a course in the navigator curriculum included 17 sources of data. Information included data gathered from CAFB Form 11 in academic and training device portions of instruction; interviews with students, subject-matter experts, and instructors; course critiques; courseware and task audits; and external evaluations, including CCTS Training Effectiveness Questionnaires and results from needs-analysis visits to gaining units. Direct knowledge and performance measures were not among the data used to validate this course, however.

DO5 reports that pure validation efforts are difficult to implement in practice, as student flows through the initial qualification training program must be maintained. As a result, if a new courseware package is deficient in some respect, the instructor must take responsibility for correcting the deficiencies on the spot and provide any instruction required for the student

to pass the course. Accordingly, such deficiencies may not be detected by an analysis of examination scores. Under these conditions, instructor questionnaires assume increased importance in tne validation effort. More generally, examination scores and proficiency ratings from aircrew training devices are not used at all in validation efforts, just as tney are not used in tne ongoing evaluation of training system effectiveness.

According to ISD procedures (AFM 50-2), evaluation is conceptualized as commencing after programs have been validated. It consists of two types: internal evaluation and external evaluation (AFP 50-58, Vol. V). In its most general sense, internal evaluation is conducted within the 93 BMW. External evaluation is conducted in the field, and it is an assessment of the extent to which the training at CCTS successfully prepares graduates to perform their flying duties at B-52 and KC-135 operational units.

There are several types of internal evaluations, some of which have already been discussed, and DO5 participates in most of them. These types of internal evaluations are separate from the SACR 50-4 performance evaluations conducted by DOV, although the latter can also be considered as internal evaluations, since they are conducted within the 93 BMW.

1. In the student critique process, DO5 is the first and last office to receive completed student critique forms from academics and the flightline. By being the first office to receive these forms, DO5 can begin coordinating changes to the curriculum almost immediately.

2. As discussed earlier, DOV conducts educational evaluation activities which are documented on Castle Form 11. DO5 is responsible for coordinating changes in the program which result from these evaluations.

3. Any agency or individual may suggest modifications to the training curriculum at any time, and this is done by completing Castle Form 211, Recommendation for Training Improvement (see Appendix, p. 38). DO5 provides an initial response to each suggestion that is submitted. The approval of the CRB is required to institute major changes to the curriculum, and this body also arbitrates any differences of viewpoint regarding potential changes.

4. DO5 is responsible for reviewing the currency of courseware at least annually or when changes are necessary for such reasons as modifications to the aircraft. These reviews are recorded on Castle Form 371, Courseware Review/Revision Checklist. DO5 reports that, in practice, external changes can force courseware reviews with such frequency that nearly every course is "reviewed" at least once annually from this process alone. In addition, all courseware must be inventoried annually, and this involves updating Castle Form 42, KC-135 CCTS Student Publications, and Castle Form 42a, B-52 Student Publications. The inventory of courseware is actually a type of tracking activity and is not an evaluation.

5. An additional type of internal evaluation is a critique of base facilities which is completed by students and forwarded to the Director of Academics. The results of these critiques are summarized, and they are sent to the Base Commander for review. DO5 has no role in this process, however.

DO5 has exclusive responsibility for external evaluation. Three methods of external evaluation are listed in AFM 50-2 and AFP 50-5?, Vol. V: questionnaires, field visits, and job performance evaluations. Only the first two types of evaluation are conducted as part of the 93 BMW external evaluation program. The completion of CCTS Training Effectiveness Questionnaires is required by SACR 51-52 and SACR 51-135. These questionnaires are completed by graduates within 30 days after having attained mission-ready status at their gaining units. An external evaluation questionnaire is also completed by gaining-unit squadron commanders or a designated representative. The designated representative is most often the Training Flight instructor who conducted the local unit upgrade of the CCTS graduate. Separate questionnaires have been designed for B-52 and KC-135 aircrews. With few exceptions, most of the questions apply to all crew positions for a given aircraft. Content items are rated on a 5-point scale. Generally, the items apply to phases of flight such as mission planning, preflight, and takeoff. Other items concern knowledge and skill areas such as crew coordination, emergency procedures, and air refueling. Items which are rated low require a written comment, presumably to determine the specific skills in which graduates are deficient. Background information is also obtained to determine, for example, how much flying graduates have actually accomplished since leaving Castle AFB. All information is entered on a computer form which is returned to the 93 BMW. The results are analyzed and presented for each class in the minutes of the CRB and TRP. Final results are presented separately for graduates and squadron commanders. Return rates and average ratings, collapsed across crew positions, are listed. Specific problem areas within a crew position are also identified if they emerge.

Periodic needs-analysis visits to operational units are conducted as a second type of external evaluation. These evaluations are performed in accordance with AFR 50-38 and SACR 55-70. CCTS graduates and personnel from operational units are interviewed to obtain specific information about the effectiveness of training at Castle AFB. In particular, evaluators attempt to ascertain what skills should be taught that are not currently incorporated into the program at the 93 BMW. Written reports from these visits are completed upon return, and they include a synopsis which identifies areas of concern for each crew position. The body of each report lists the number of graduates at each crew position who were interviewed, wing personnel interviewed, and specific areas of concern. Reports of results are distributed to major offices within the 93 BMW, and to HQ SAC, 15 AF, and 12 AD. All reports are maintained in a file at the DO5.

The 12 AD and Command CRBs are additional forums for external evaluation, but they are informal means of evaluation. Changes in job requirements may also be included in discussions at these meetings.

Curriculum Review Groups, the Curriculum Review Board, and the Training Review Panel

The CRGs, CRB, and TRP are the formally established bodies at the 93 BMW which review the status of the entire aircrew training curriculum and make decisions affecting the programs. The CCTS review process occurs in a hierarchical fashion. DO2B and DO2K chair the CRGs. These groups are considered as the working groups of the CRB. The Deputy Commander for

Operations chairs the CRB. The Wing Commander chairs the TRP which is the highest level of review of the CCTS program within the 93 BMW.

As a minimum, the items of information tracked and published by these bodies, in addition to discussion items from the CRGs and CRB, are: (a) number of classes graduated; (b) external evaluation results; (c) flying hours and sorties requested and flown for each month; (d) student loads per class; and (e) a 3-month recap of S/E results, with areas of interest and weaknesses identified by the trends analysis program. Class Summaries, described above, are attached to the TRP report.

V. SYNOPSIS OF INFORMATION SYSTEM

The essential data items comprising the information system will now be categorized in order to provide a summary statement of the system and make it more amenable to analysis in the Discussion. In accordance with the stated purpose of the present effort, the emphasis is on the evaluation function. Table 1 presents three categories of information: student evaluation, program evaluation, and management of student instruction. The main data items in each category are enumerated, while items not serving critical functions in these processes are deleted from the presentation.

Student Evaluation. There are ample provisions for evaluating student learning and performance throughout the training program at the 93 BMW. Examination scores and the results of sessions in aircrew training devices are recorded in the 329 CCTS. In the flightline phase of training, proficiency ratings for each WST and aircraft event are recorded on progress sheets, and flying training events are logged on the TAR. The point at which proficiency is attained for a flying event is also indicated on the TAR. The SACR 60-4 evaluation is conducted after the flying phase of training is completed. There are also provisions for recording qualitative information with these flying evaluation procedures. Critique items are noted on the progress sheets and the SACR 60-4 evaluations.

Program Evaluation: Process and Outcome. Table 1 lists four types of process evaluations and three types of outcome evaluations used for program evaluation. Process evaluations include student critiques of the academic and flightline phases of instruction, educational evaluations and evaluations of training devices conducted by DOV, and recommendations for training improvement. Outcome measures used for program evaluation are SACR 60-4 evaluations and the associated trends analysis results, the results from training effectiveness questionnaires, and results of needs-analysis visits to gaining units. The SACR 60-4 evaluations and the trends analysis results are the only data which come from direct performance evaluations. Evaluations receiving the greatest visibility within the Wing are student critiques of training, SACR 60-4 evaluations and trends analysis results, and training effectiveness questionnaires. It is important to emphasize that examination scores from academics and the performance data collected during instructional sessions in aircrew training devices and the aircraft are not used in formal, systematic program evaluation.

Management of Student Instruction. The completion of blocks of academic instruction and sessions in aircrew training devices are tracked on the

Table 1: Summary of Primary Items of Information

Student evaluation

- Examination scores and ATD results in academics
- Progress records for WSTs and aircraft sorties/ Training Accomplishment Reports
- SACR 60-4 individual evaluations (AF Form 8)

Program evaluation: process and outcome

- Student critiques of academic and flightline instruction
- S/E educational evaluations and evaluations of training devices
- Recommendations for training improvement
- SACR 60-4 evaluations (Class Summary) and trends analysis results
- Training effectiveness questionnaires: graduates and squadron commanders
- Needs-analysis visits to gaining units

Management of student instruction

- Criterion test record: examinations and ATD sessions
- Training Accomplishment Reports/Progress Records

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criterion test record in the 329 CCTS. The TAR and progress records are used to track event accomplishments and the attainment of proficiency for WST and flying events during the aircraft phase of instruction, and they also provide information used to schedule flying events. Flight commanders and DO2B/K sign all TARs at the conclusion of the training program, to ensure that all flying instruction has been received or event waivers have been obtained.

VI. DISCUSSION

It will be recalled from the Introduction that judgments of program effectiveness are dependent primarily on outcome measures (Patton, 1986, p. 345; Scriven, 1982, p. 48). Why or how a program is effective or ineffective is determined through an evaluation of program processes and operations (Judd, 1987). Process evaluations are also useful for improving program effectiveness and efficiency. Ideally, both types of evaluation

should be combined in program evaluations (Cronbach, 1982; Judd, 1987; Scriven, 1982, p. 121). Properly used, the two data sets are interactive. A full interpretation of outcomes or program effectiveness is dependent upon the results of process evaluations, and the improvement of a program, engendered primarily through process evaluations, must be gauged relative to subsequent outcomes.

Fairly comprehensive sets of student learning and performance data are currently collected throughout all phases of training at the 93 BMW (see Table 1: Student Evaluation). Although all of these data are used to evaluate student learning and performance and to manage the program of instruction, SACR 60-4 checkride results are the only outcome measures used in formal, internal evaluations of program effectiveness. Academic test scores and proficiency measures/event accomplishments from aircrew training devices and the aircraft are not aggregated and analyzed to provide estimates of training effectiveness associated with these phases of instruction. This replicates the finding of Bruce et al. (in preparation), where it was determined that the main function of knowledge and performance evaluations at SAC operational units is to assess the competence of aircrews, not necessarily the effectiveness and efficiency of training. Training effectiveness questionnaires and needs-analysis visits to gaining units are additional outcome evaluations used to assess the effectiveness of the CCTS program, but they are used to evaluate the program externally--not internally.

Sole reliance on using SACR 60-4 performance assessments and the associated trends analysis results for evaluations of internal program effectiveness can be likened to a "black-box" approach to evaluation. The focus is on the terminal outcome measures alone, since these measures occur at the conclusion of a fairly lengthy process of training which contains multiple phases and components. The SACR 60-4 outcome measures are not referenced to any process evaluation results or descriptions of current training practices, and other more localized outcome measures which correspond to the individual phases or components of instruction are not considered at all by this method of program evaluation. Hence, the nature of the training program remains a "black box." One may know that training is effective or ineffective, but not what type of training has been proved effective or why it is effective. Additional limitations of black-box approaches to evaluation have been discussed by other evaluators (e.g., Patton, 1986, pp. 122-149; Scriven, 1982, p. 18).

There are other consequences of considering only checkride and associated trends analysis results when evaluating internal program effectiveness. First, SACR 60-4 evaluation results must be considered as only general outcome measures which represent the combined effects of exposure to the entire training regimen. From these results, one cannot make conclusions about the effectiveness of individual components of the training system or the transfer of training between components. It would, therefore, be tenuous to assume that the entire training system was effective based on these results alone. It is possible that one phase or component of instruction could compensate for an earlier, inadequate phase of instruction, although the net effect of instruction in these components may be to produce performance sufficient to pass a checkride. For example, one could not assume that current versions of WST training were effective simply because students successfully passed checkrides. The effectiveness of WST training would require a detailed

evaluation in its own right, including an analysis of performance measures collected during simulator and aircraft phases of instruction. Indeed, determinations of the effectiveness of aircrew training devices at the 93 BMW have relied on such independent evaluations (Bruce & Keyes, in preparation; Gray, 1979; Nullmeyer & Laughery, 1980), but they are conducted very infrequently, typically as part of Operational Test and Evaluation. The design, operation, and improvement of a fully effective training system requires, however, the continuous, formal evaluation of all components and phases of instruction, separately and in combination, particularly since program operations are likely to change over time.

Another consequence of reliance on SACR 60-4 checkride and trends analysis results is that these evaluations assess only a sample of the total knowledge and skills required of graduates. If these assessments included the entire spectrum of knowledge and skills in the formal school program, they would be forbiddingly expensive in time and other program resources. Accordingly, one must conduct other supplementary evaluations to determine if the system effectively trains knowledge and skills not contained in the typical checkride. This issue is beginning to be discussed more fully with the advent of contracted aircrew training, as it is particularly relevant in a contractual sense (R.T. Nullmeyer, personal communication, 1987). For example, if a contractor is responsible for training a specified set of skills or ensuring that students meet set performance objectives, there must be other means of assuring that these obligations have been met, if only a portion of the objectives or skills is sampled by the checkride. One way of doing this is to use the appropriate outcome data associated with the individual components of instruction.

The trends analysis program is considered a principal means of detecting and correcting deficiencies in the training program. Realistically, since trends analysis results are based solely on outcome measures that are collected at the conclusion of training, they can be used only to detect that a problem may potentially exist with the training system. By themselves, these data provide little information for effective action. Other kinds of evaluative data are required to determine where in the system a training problem may reside, the precise nature of the problem, and how it might be corrected. In a systematic approach to problem diagnosis and correction, one must first validate that a problem exists with the training system, for the identified problem could be an effect specific to the SACR 60-4 evaluation process itself or some other factor. Next, a determination of where in the training system the problem may reside would require local outcome measures or other data associated with the various components in academics, simulators, and the aircraft. Once the locus had been established, it would then be necessary to have information about the processes of instruction associated with the defective component(s) in order to determine the precise nature of the training problem. If data were unavailable, independent observations of training would have to be made to suggest possible areas of difficulty. The process information would, in turn, be useful in devising alternative solutions to correct the training problem. Once changes to the system were implemented, localized output measures associated with the previously defective component could then be monitored. These measures could be compared with subsequent trends analysis results to confirm that the training problem had been resolved. One could hypothesize that routine collection and use of localized measures of component effectiveness might reduce the number of

trends detected by the trends analysis program, although this is subject to an empirical test. Such a use of localized measures would be considered preventive, since problems would not need to await detection by the trends analysis program.

A systematic diagnostic and change process such as that described above does not typically occur, however. There is considerable variation in the action applied to trends, but it is not uncommon for a short-circuiting of the involved troubleshooting and change process to occur. For example, instructors may be requested to "re-emphasize" certain aspects of training, but this is no real solution for correcting a potential deficiency in the training system. Further, the effects of such admonishments can be short-lived. Significant deficiencies in a training program require a more systematic approach for effective and durable resolution.

The remaining sets of data used for internal evaluation--student critiques, S/E academic evaluations and evaluations of training devices, and recommendations for training improvement--relate to the processes of instruction. As such, they assess the manner in which instruction is delivered, whether instructors are helpful, if instructional materials and test items are understandable, and other targets of evaluation. All phases and components of instruction are evaluated--at least partially--by these methods. Importantly, these evaluations also reflect a number of viewpoints, such as those of students, experienced evaluators, and instructors.

In practice, the process evaluations (especially student critiques) are often interpreted as indicators of training effectiveness at the 93 BMW. It is important to re-emphasize, however, that determinations of effectiveness relate to the observed outcomes of instruction (see Patton, 1986, p. 345; Scriven, 1982, p. 48). Accordingly, measures of student learning and performance are essential in making these judgments. Even if student critiques are viewed by the students themselves as devices to record impressions of training effectiveness (which they often are), one can seriously question the capability of students to render such judgments, particularly during initial qualification training. The legitimate use of student critiques as measures of program effectiveness would assume a valid, internalized set of knowledge and performance standards on the part of students, which is very tenuous indeed. More likely, experienced external evaluators are required to make valid assessments of whether students are performing in accordance with established standards, and whether instruction is effectively producing those outcomes (M.R. Rockway, personal communication, 1986). These comments are not intended to denigrate the importance of student evaluations of instruction; rather, they are intended to clarify the nature of the judgments which can be derived from such critiques. Many important results of instruction, including unintended ones, can be detected from these types of evaluations. This information is, in turn, crucial for designing effective and efficient training systems.

Another common practice at the 93 BMW is that the results of process evaluations are acted upon independently of outcome results associated with the same components or phases of instruction. This is largely because the outcome measures are used for student evaluation and instructional management, but it is also because some of the process evaluations are administered separately by different organizations (e.g., DOV) within the 93 BMW. The

consequence of these parallel evaluation functions is that the program may be modified solely on the basis of process evaluations such as student critiques. Comparisons between process and outcome measures associated with the same components of instruction can be used in some cases to verify that a component is functioning problematically. When using process evaluations for the subsequent improvement of instruction, individuals who use such information may take into account the likely outcomes of resulting alterations to instruction, but it is important that such changes also be directly related to observed outcomes. Improved effectiveness or greater efficiencies could then be confirmed, or changes which produce subsequent decrements in effectiveness or efficiency could be documented for future reference.

The formal school is part of a larger continuum of training for B-52 and KC-135 which includes mission qualification and continuation training. External evaluation is one mechanism by which impacts on the larger training system can be assessed. Adjustments or additions to the formal school program can also be made on the basis of these evaluations. External evaluation is an important part of the overall program evaluation at the 93 BMW, as training may be judged effective internally, yet fail to meet the expectations and actual needs of the operational units. The consequences of insufficient training at the formal school are serious, as training resources are comparatively scarce at the gaining units (Bruce et al., in preparation).

Both training effectiveness questionnaires and needs-analysis visits are essential components of external evaluation. They focus on different, yet complementary, aspects of external evaluation. Training effectiveness questionnaires attempt to assess how well graduates can actually perform at the gaining unit those tasks which are currently trained at the formal school. Needs-analysis visits, by contrast, are geared toward ascertaining other program needs which are not incorporated into the existing training program. Needs-analysis information is vital, as there may be changes in the nature of missions at operational units which require either different skills or extensions of skills already trained in the CCTS program. This is especially pertinent considering the increasing conventional role of the B-52 (Bruce et al., in preparation). The full range of needs at operational units must also be assessed, as there are variations in mission types from unit to unit. Accordingly, needs-analysis visits must incorporate clear provisions for frequent sampling across a wide range of operational units.

The actual allocation of additional training requirements to the formal school is a complex process. The entire continuum of training for B-52 and KC-135 should be considered in making these decisions, and they should be based, in part, on the results of needs-analysis visits and current CCTS training requirements. Resources which are available for use in training at selected points throughout the entire system must also be considered. In this regard, the formal school has a greater concentration of training resources than gaining units. Additional factors to be considered at operational units may include current training requirements, alert requirements, and other activities which directly compete with the accomplishment of training. The latter factor includes higher headquarters directives and special missions (Bruce et al., in preparation).

The needs-analysis visits conducted by the 93 BMW occur infrequently. In the absence of more frequent information from needs-analysis visits or

information provided directly by operational units, the 12 AD and Command CRBs and Wing Commander conferences furnish other opportunities for cross-checks in this important area of evaluation. Needs identified in these forums could be systematically combined and documented with those of needs-analysis visits, to provide a more comprehensive, running account of overall program needs. Results of needs-analysis visits should also receive visibility comparable to those of training effectiveness questionnaires which are published in the CRB and TRP minutes at the 93 BMW. Such a practice would permit a fuller interpretation and demonstration of the external value of the CCTS program.

Training effectiveness questionnaires are completed by graduates and gaining-unit squadron commanders. Since graduates have completed one or more flying missions at gaining units prior to filling out these questionnaires, they have a more valid framework for determining if training at the 93 BMW adequately prepared them to perform their flying duties. Questionnaires completed by squadron commanders can be particularly important sources of information, since they are completed by operational personnel external to the 93 BMW. Their value is dependent, however, on the use of additional data by squadron commanders. These data could consist of proficiency ratings for various flying events, critique items, or other evaluative data collected on incoming graduates of the CCTS program. The use of these data would ensure more valid ratings on the questionnaire itself. Ideally, external evaluators should be instructed to use all available information in completing these questionnaires, and they should also identify what particular items of information were actually used. Such a procedure would assist in the interpretation of external evaluation results.

The discussion thus far has not been intended to suggest that shortfalls in current evaluation practice at the 93 BMW, such as the reliance on SACR 60-4 evaluations in determinations of program effectiveness, result from an inadequate conceptualization of evaluation. Evaluation practice and changes to it typically result from practical considerations such as the requirements for information. The reliance on SACR 60-4 evaluation results for assessments of program effectiveness has been, until recently, a defensible practice. Despite their limitations, these evaluations are good, general measures of program effectiveness. Deficiencies in flying can be detected from them, and they are economical relative to more precise component and system evaluations which require more evaluation resources. The consideration of evaluation resources suggests that evaluation practice be viewed as a trade-off between information and evaluation requirements and the available resources to conduct evaluation (Cronbach, 1982). Accordingly, given past evaluation requirements and available resources, the practice of using checkride results alone to evaluate training system effectiveness is appropriate, and it has worked for many years. But the situation has changed significantly. Recent requirements for evaluations of aircrew training devices, the advent of contracted aircrew training, and the likely requirement to more effectively justify training resources such as flying hours renders this approach to evaluation insufficient. Checkride results alone do not provide the needed information. Evaluations which assess training components, their interactions, and the training system as a whole are, therefore, likely to become the standard (e.g., Aeronautical Systems Division, 1986; Fishburne et al., 1987, pp. 29-40; Spears, 1986). This will require, however, an investment in more evaluation resources. Evaluation must then demonstrate a responsiveness to these challenges; that is, it must be worth the investment.

Perhaps the principal point to be raised with respect to evaluation at the 93 BMW is that the Wing currently collects most of the primary information from which more detailed component and system evaluations can be conducted. As we have seen, examination scores in academics, and proficiency ratings and event accomplishments in aircrew training devices and the aircraft, are routinely recorded, although they are used for different purposes (i.e., student evaluation and management of instruction). These measures are, in fact, the primary measures upon which previous effectiveness evaluations of aircrew training devices at the 93 BMW have relied (e.g., Bruce & Keyes, in preparation; Nullmeyer & Laughery, 1980). These evaluations not only demonstrated the effectiveness of expensive aircrew training devices, but they also suggested how the devices should be used. These types of evaluations should be conducted routinely, as information of such importance should not be dependent upon infrequent FOT&Es. What we are trying to affect, then, is information use, as the Wing has already invested resources in collecting the information. Accordingly, our previous discussion can be considered, in part, a justification for using all the available evaluative information, and using it in a certain manner--to evaluate student progress and the training system.

There are two important areas which need to be addressed in order to implement the prescribed use of training information. The current manual record keeping system at the 93 BMW would make routine processing and analysis of examination scores, proficiency ratings, and event accomplishments extremely labor-intensive. The problem of manual record keeping systems was also noted in the assessment of current C-130 training (Fishburne et al., 1987, p. 81). This situation is particularly acute, since the annual throughput rate for initial qualification and pilot/navigator-upgrade training at the 93 BMW is nearly 2,000 students. Computer support is, therefore, essential. The requirements for computer assistance would increase further if all training information and evaluation results were included in a central, computerized database. This automation would permit, however, the continuous tracking and assessment of the effectiveness of instructional components and the training system as a whole. Automation would also permit more rapid detection, diagnosis, and follow-up of training system problems and furnish a means of permanent documentation. More generally, it would be a step toward unifying the entire information and evaluation system. This is an important benefit, as it was mentioned previously that many of the evaluations are currently conducted and used in a parallel fashion.

The second area which needs to be addressed is that evaluation functions are now seriously fragmented throughout the 93 BMW. Separate evaluations are conducted by the 329 CCTS, 93 AREFS, 328 BMS, DOV, and DO5. This practically ensures that many appropriate and informative comparisons of evaluation results collected by these different offices will not be made, and that responsibility for action on the basis of evaluation results will be too diffuse. Utilization of a central database for program evaluation would also seem to require, then, a centralized office for processing and analyzing all evaluation results, and coordinating and managing the use of evaluative information within the training system.

There is an additional ingredient which is necessary for the effective functioning of the evaluation system: the development of a comprehensive, integrated evaluation plan. Such a plan is necessary, given the complexities of an aircrew training system, current training and evaluation requirements at

a variety of levels, and the diverse informational needs of curriculum developers, evaluators, training managers, and senior Wing administrators. In essence, integrated training systems require integrated evaluation plans which serve as effective guides for coordinated information collection, processing, and use (Nullmeyer, McGann, & Rooney, 1986). The development of this plan is to be an important part of the upcoming CCTS Modernization effort.

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GLOSSARY OF ACRONYMS

AD	Air Division
AF	Air Force
AFM	Air Force Manual
AFORMS	Air Force Operational Resource Management System
AFP	Air Force Pamphlet
AFR	Air Force Regulation
AREFS	Air Refueling Squadron
ATC	Air Training Command
BMS	Bombardment Squadron
BMW	Bombardment Wing
CAFBR	Castle Air Force Base Regulation
CCTS	Combat Crew Training School
CPT	Cockpit Procedures Trainer
CRB	Curriculum Review Board
CRG	Curriculum Review Group
DG	Distinguished Graduate
DO	Deputy Commander for Operations
DOT	Director of Training
DOTB	Aircrew Scheduling: Bomber
DOTF	Operations Systems Management Branch
DOTK	Aircrew Scheduling: Tanker
DOV	Standardization/Evaluation Division
DOVB	Standardization/Evaluation: Bombers
DOVK	Standardization/Evaluation: Tankers
DO2B	Training System Management: Bombers
DO2K	Training System Management: Tankers
DO5	Instructional Systems Development Division
DO5S	Instructional Systems Development Division: Scientific
FOT&E	Follow-On Operational Test and Evaluation
GAO	General Accounting Office
HQ SAC	Strategic Air Command Headquarters
ISD	Instructional Systems Development
MAR	Mission Accomplishment Report
OT&E	Operational Test and Evaluation
PR	Progress Record
SAC	Strategic Air Command
S/E	Standardization/Evaluation

TAC	Tactical Air Command
TAR	Training Accomplishment Report
TRP	Training Review Panel
UNT	Undergraduate Navigator Training
UPT	Undergraduate Pilot Training
WST	Weapon System Trainer

APPENDIX:
KEY DATA ITEMS AT THE 93 BOMBARDMENT WING

INITIAL QUALIFICATION CRITERION TEST RECORD

CRITERION TEST	GRADE	INSTRUCTOR INITIALS
AIRBLEED	(CB)_____	_____
AIR REFUELING	(CB)_____	_____
AUTOPILOT	(CB)_____	_____
COMMUNICATIONS	CM4(CB)_____	_____
	CM2(CB)_____	_____
CREW COORDINATION	(CB)_____	_____
ELECTRICS	(CB)_____	_____
EMERGENCY PROCED.	(BP)_____	_____
	(CB)_____	_____
ENGINES	(CB)_____	_____
FLIGHT CONTROLS	(CB)_____	_____
FUELS	(CB)_____	_____
HYDRAULICS	(CB)_____	_____
INSTRUMENTS	(OB)_____	_____
LIFE SUPPORT	(CB)_____	_____
LOW LEVEL	LL9,8,7(CB)_____	_____
	LL4(CB)_____	_____
	CHART(OB)_____	_____
NORMAL PROCED.	CFT EVAL_____	_____
OXYGEN	(CB)_____	_____
PERFORMANCE	(CB)_____	_____
WEAPONS	(OB)_____	_____
MID-PHASE TEST	(CB)_____	_____
ORC TEST	(CB)_____	_____

NAME _____ CLASS _____

CCTS STUDENT CRITIQUE (ACADEMICS PHASE)	TYPE AIRCRAFT	DATE	COURSE CODE
	CREW POSITION	CLASS	BASE ASSIGNED
NAME	RANK	TOTAL FLYING HOURS	

INSTRUCTIONS: To assist us in improving the B-52/KC-135 Combat Crew Training course we would appreciate you rating each of the areas listed below which can be rated Outstanding (O), Satisfactory (S), or Unsatisfactory (U). Check (✓) the rating each item which best expresses your opinion. If you rate an item Unsatisfactory (U), give specific comments and recommendations for improvement.

ITEMS	COMMENTS	RATINGS O	S	U
1. INSTRUCTORS: (Class Control, Attitude, Enthusiasm, Helpfulness, Understandable)				
2. INDIVIDUAL ASSISTANCE: (Remedial Instruction, Counseling)				
3. TRAINING METHODS: (Amount of Theory & Practical, Use of training time, Student Participation)				
4. TRAINING LITERATURE: (Availability, Use and Helpfulness, Student Study Guides, Workbooks, Technical Orders)				
5. VISUAL AIDS: (Availibility, Use and Helpfulness, Films, Transparencies, Charts)				
6. SYNTHETIC TRAINING AIDS: (Pilot Simulators, T-40, F-10, T-4, T-1A Trainers)				
7 EXAMINATIONS, TESTS: (Understandable, Administration, Critique)				
8 OVERALL EVALUATION OF COURSE				

ADDITIONAL COMMENTS (Use reverse side if more space if required)

CASTLE FORM 49 REVISED * APR 82

KC-135 PROGRESS REPORT - FLIGHT PHASE - PILOT

STUDENT (Last name, First, MI):	RANK:	CREW NO:	CREW POSITION (CIRCLE ONE): P CP PUP P REQ IP REQ

SORTIE DATE:	SORTIE NUMBER:	TAKEOFF TIME:	FLYING TIME:	AIRCRAFT NUMBER:

INSTRUCTIONS: Column 1: enter number of times event accomplished. Column 2: enter F or D if Familiarization or Demonstration only. Remaining columns: enter number of times event accomplished at each proficiency level (DO-10 51-11).

Required Instr Intervention	DEMONSTRATION REQUIRED	EXTENSIVE ASST REQUIRED	SUBSTANIAL ASST REQUIRED	LIMITED ASST REQUIRED	COACHING FOR TECHNIQUE	NONE-ERRORS COR BY STUDENT	NONE
	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Student Performance	LACK OF KNOWLEDGE		SIGNIF ERRORS OR DEVIATIONS		SLIGHT ERRORS OR DEVIATIONS		NO ERRORS OR DEVIATIONS

KEY	CODE	☐INFLIGHT ☐WST TRAINING EVENT	ACC	F/D	PROFICIENCY LEVELS 1.0	1.5	2.0	2.5	3.0	3.5	4.0
		TAKEOFF AND CLIMB									
1	40	PREFLIGHT									
2	47	PRETAKEOFF									
3	P08	TAKEOFF									
4	P11	TAKEOFF NIGHT									
5	P12	T.O. CLIMB PROC									
6	P20	T.O. GYRO MODE									
7	P25	T.O. WET									
8	P35	SIM ENG FAIL, TO CONT									
9	P55	T.O. HVYWT 30°									
10	13	MITO (LEAD)									
11	P24	MITO (NOT LEAD)									
12	P26	CELL DEP/JOIN-UP (LD)									
13	P26	CELL DEPT/JOINT-UP(N-LD)									
14	I02	INST DEPT									
15	99	CLIMB									
16	P06	CREW COORD									
		AIR REFUELING									
17	P22	CELL FORM									
18	14	A/R FORM/TKR CELL (LD)									
19	R19	A/R FORM/TKR CELL (N-LD)									
20	R36	ENROUTE RENDZ									
21	R42	PRIMARY RENDZ									
22	R40	TKR ALT RENDZ									
23	R46	TKR RENDZ OVRN PROC									
24	R41	TKR A/R									
25	R44	TKR A/R INDOC									
26	R15	FTR A/R INDOC									
27	R45	TKR A/R BREAKAWAY									
28	R55	TKR A/R AP OFF									
29	P06	CREW COORD									
		NAVIGATION									
30	N16	NAV AID FIXING									
31	N51	CELL NAV LEG									
32	P37	AP OFF CRUISE									
33	79	CRUISE									
34	P06	CREW COORD									

NARRATIVE DESCRIPTION OF STUDENT PERFORMANCE, INCLUDING DISCREPANCIES/RECOMMENDED CORRECTIVE ACTION, IF NECESSARY.

KEY	CODE	TRAINING EVENT	ACC	F/D	PROFICIENCY LEVELS 1.0	1.5	2.0	2.5	3.0	3.5	4.0	NARRATIVE DESCRIPTION OF STUDENT PERFORMANCE, INCLUDING DISCREPACIES/RECOMMENDED CORRECTIVE ACTION, IF NECESSARY.
		AIR WORK										
35	P73	APP TO INIT BUF & RECOV										
36	P57	SPOILER DEMO										
37	P70	TRIM DEMO										
38	P71	SIM JAMMED STAB PROC										
39	P40	EMER OP LND GEAR										
40	P41	EMER OP WING FLAPS										
41	P57	AIRWORK EXERCISE										
		LANDINGS										
42	P14	LANDING FULL STOP										
43	P16	LANDING - NIGHT										
44	P33	LND 30°FLAP										
45	P61	APP & LND SIM 3 ENG										
46	P97	TOUCH & GO LND										
47	P13	LANDINGS (TOTAL)										
48	19	CROSSWIND LDG										
49	P06	CREW COORD										
		INSTRUMENTS										
50	I08	HOLDING										
51	55	DESCENT										
52	I15	ENROUTE DESCENT										
53	I06	PEN (PUBLISHED)										
54	P27	ABN RADAR APP										
55	I03	PAR APP										
56	I04	ILS APP										
57	I05	ILS AUTO APP										
58	I12	ILS-GYRO MODE										
59	I23	PREC APP										
60	I17	TACAN/VOR/LOC										
61	I18	ASR APP										
62	I09	NON-PREC APP										
63	I10	MISSED APP										
64	I07	INST APP & M/A SIM 3 ENG										
65	P39	AP & G/A SIM 3E (RD PWR OFF)										
66	I11	VOR/TACAN PROC										
67	P06	CREW COORD										
		MISCELLANEOUS										
68	G18	BAILOUT/DITCH/CRASH LND										
69	P03	MISSION PREP										
70	P04	ACFT EQUIP FAM										
71	41	INS										
72	N68	INS/DNS										
73	P05	CHECKLIST PROC/USE										
74	57	POSTFLIGHT										
75	P31	INST TECHNIQUE										
76	59	MSN PAPERWORK										

OVERALL GRADE: U M S E	STUDENT SIGNATURE:	INSTRUCTOR SIGNATURE:	KPCH:	VER:	AUD:

B-52 PILOT/COPILOT STUDENT TRAINING ACCOMPLISHMENT REPORT

CREW NO.: ☐ PUP ☐ CP ☐ P ☐ RQP

NAME:

FLIGHT TIME

AIRCRAFT NO.

DATE OF TDE

	ITEM #	DESCRIPTION	RQ	P	CP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
PROF	P01	SOLO SORTIE		1																									
	P03	MISSION PLAN/BRIEF	P	P	P																								
	P06	CREW COORDINATION	P	P	P																								
TAKEOFF/CLIMB	P08	TAKEOFF	P	P	P																								
	P10	TAKEOFF CP DUTIES			P																								
	P12	TO & CLIMB PROC	P	P	P																								
	P25	TAKEOFF WET "G"	P	P	1																								
	P11	TAKEOFF NIGHT	P	P	P																								
	P24	MITO	P	P	F																								
	P26	CELL DEPT & JOIN		1	1																								
	P22	CELL FORMATION		1	1																								
AIR REFUELING	R02	RENDZ POINT PAR	P	P	F																								
	R13	OVER-RUN PROC		1	F																								
	R36	ON-CRS/ENROUTE RENDZ	1	1	1																								
	R01	AR DAY/NIGHT	P	P																									
	R05	AR (NITE)	P	P																									
	R17	AR PROCEDURES(INFLIGHT)			P																								
	R11	AR BREAKAWAY	P	P																									
	R30	AR TANKER A/P OFF	P	P																									
	R31	AR RCVR A/P OFF	P	P																									
NAVIGATION	N09	TA/EVS NAV LEG	P	P	P																								
	N10	TA OPS CHECK	P	P	P																								
	N14	NIGHT TA/EVS EVS LEG	F	F	F																								
	N15	LOW ALT NAV (D/N)	P	P	P																								
	N87	NIGHT MNT TA/EVS NAV LEG	F	F	F																								
BOMBING WPN SYS	B01	MULTI RELEASE LOW	P	P	P																								
	B68	MULTI REL L ALTITUDE(ALT)	P	P	P																								
	B67	MULTI REL L ALTITUDE(SYNCH)	P	P	P																								
	B09	SINGLE REL HI ALTITUDE	P	P	P																								
	T29	TA PUP	P	P																									
	T80	HI SPEED BOMB RUN		1	1																								
	F01	FTR INTERCEPT EXER		1	F																								
INSTRUMENTS	I02	INSTRUMENT DEPT	P	P	P																								
	I11	VOR/TACAN PROC	P	P	P																								
	I08	HOLDING		P	P																								
	I06	PENETRATION	P	P	P																								
	I15	ENROUTE DESCENT	P	P	P																								
	I03	PAR APPROACH	P	P	P																								
	I04	ILS APPROACH	P	P	P																								
	I17	TAC/VOR APP	P	P	P																								
	I18	ASR APPROACH	P	P	P																								
	I10	MISSED APPROACH	P	P	P																								
	P27	ABN RADAR DIR APP	1	P	F																								
LANDINGS	P13	LANDING	P	P	P																								
	P14	LND FL STP	P	P	P																								
	P16	LANDING (NIGHT)	P	P	2																								
	P32	APP & LND W/ARBK 0		1	F																								
	P33	APP & LND W/ARBK 2		1	F																								
	P34	APP & LND W/ARBK 6		1	F																								
EMER PROC	P18	INIT BUFFET & REC	1	P	P																								
	P21	FLAPS UP APP	P	P	1																								
	P15	SIM LOSS1 ENG TO	P	P	2																								
	I19	SIM 6 ENG APP & GO AR	P	P	2																								
	P66	SIM 6 ENG APP & LND	P	P	F																								

CASTLE FORM 194 OCT 83 REVISED * *

ITEM	DESCRIPTION	P	CP	PUP	RQP	COMPLETION DATE	TOTAL
A01	CCTS ACADEMIC COURSE	1	1	-	-		
A06	B-52 REQUALIFICATION COURSE	-	-	-	1		
M01	AIRCRAFT FIELD TRIP	1	1	-	1		
	ASYM THR SEM	1	1	1	-		
G04	AREODYM CHARACTERISTICS	1	1	1	-		
G32	INIT EVASIVE ACT BRIEF	1	1	1	-		
	KNOWLEDGE OF DIRECTIVES	1	1	1	-		
M14	ALERT START CARTRIDGE	1	1	1	1		
S01	COCKPIT PROCEDURES TNR	12	12	6	-		
Q05	C.P.T. EVALUATION	1	1	1	1		
Q13	SACR 60-4 EVALUATION	1	1	1	1		
R17	AR PROCEDURES (ARPTT)	-	P	-	-		
	ARPTT PROFICIENCY	P	-	P	-		
S41P	CPT/MST	-	-	-	4		
R08	AR. HVY WT (ARPTT)	1	-	1	-		

REMARKS (EXPLAIN TRAINING LOSSES):

ENTRIES REVIEWED INITIAL APPROPRIATE BLOCK

SORTIE	STUDENT	INSTRUCTOR	SQN OPS	DOTP	DOTN	DOO	DOTF	DOT	DATE
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									

STUDENT SIGNATURE:	INSTRUCTOR SIGNATURE:	FLIGHT CC SIGNATURE:	DO2B SIGNATURE:

NOTE: CIRCLED ITEM INDICATE PROFICIENCY.

CCTS STUDENT CRITIQUE (Flying Phase)	TYPE AIRCRAFT	DATE	COURSE CODE
	CREW POSITION	CLASS	BASE ASSIGNED
NAME	RANK	TOTAL FLYING HOURS	

INSTRUCTIONS: To assist us in improving the B-52/KC-135 Combat Crew Training course we would appreciate you rating each of the areas listed below which can be rated Outstanding (O), Satisfactory (S), or Unsatisfactory (U). Check (✓) the rating for each item which best expresses your opinion. If you rate an item Unsatisfactory (U), give specific comments and recommendations for improvement.

ITEMS	COMMENTS	RATING O	RATING S	RATING U
1. INSTRUCTORS: (Attitude, Enthusiasm, Helpfulness, Understandability)				
2. FLYING TRAINING: (Use of time, equipment, maintenance, flying schedule)				
3. SYNTHETIC TRAINING AIDS: (Pilot simulators, T-10, F-1A Trainers)				
4. STANDARDIZATION DIVISION: (Tests, Flying evaluation, critique)				
5. OVERALL EVALUATION OF FLYING TRAINING				

ADDITIONAL COMMENTS (Use reverse if more space is required)

CERTIFICATE OF AIRCREW QUALIFICATION

DATE COMPLETED

I. EXAMINEE IDENTIFICATION

NAME *(Last, First, Middle Initial)*	GRADE	SSAN
ORGANIZATION AND LOCATION	**ACFT/CREW POSITION**	**ELIGIBILITY PERIOD**

II. QUALIFICATION

GROUND PHASE			FLIGHT PHASE	
EXAMINATION/CHECK	**DATE**	**GRADE**	**MISSION/CHECK**	**DATE**

QUALIFICATION LEVEL			RESTRICTION	ADDITIONAL TRAINING
QUALIFIED		UNQUALIFIED	*(Explain in Comments)* ☐ YES ☐ NO	**DUE DATES**
1	2	3		
EXPIRATION DATE OF QUALIFICATION				**DATE ADDITIONAL TRAINING COMPLETED**

COMMENTS *(If more space is needed, continue on reverse)*

III. CERTIFICATION

	TYPE NAME AND GRADE	ORGANIZATION	CHECK: CONCUR	CHECK: DO NOT CONCUR	CHECK: REMARKS	SIGNATURE	DATE
1	FLIGHT EXAMINER						
2	REVIEWING OFFICER						
3	FINAL APPROVING OFFICER						

I CERTIFY that I have been briefed and understand the action being taken this date

DATE	TYPED NAME AND GRADE OF EXAMINEE	SIGNATURE

AF FORM 8 APR 79 PREVIOUS EDITION WILL BE USED

U.S. G.P.O. 1984-420-979/13379

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 93D BOMBARDMENT WING (SAC)
CASTLE AIR FORCE BASE, CA 95342

REPLY TO ATTN OF: DOV

SUBJECT: Stan Eval Report for _____

TO: 93 BMW/DO-1 93 BMW/DO-2

1. Stan Eval completion date:

2. The results of the initial qualification/requalification standardization checks are submitted below. Annual rates are based on initial qualification checks only.

3. Summary (by crew position):

a. This class:

	CHECKED	Q1	Q2	Q3	%Q1	%Q2	%Q3
PILOT							
COPILOT							
RADAR NAV							
NAV							
EWO							
GUNNER							
TOTALS							

b. Annual Classes: _____ to _____

PILOT							
COPILOT							
RADAR NAV							
NAV							
EWO							
GUNNERS							
TOTALS							

c. Requalification

PILOT							
PILOT CPT (Only)							
RADAR NAV/NAV							
EWO							
TOTALS							

JOHN R. WRIGLEY, Major, USAF
Chief, Stan Eval Bomber Branch

2 Atch
1. CAFB Form 74
2. Reasons for Student Q2/Q3

B-52 RADAR NAV/NAV TRENDS ANALYSIS WORKSHEET						
NAME:				CREW:		POSITION:
EVALUATOR:				DATE EVALUATED:		TYPE CHECK:
AREA	N/O	U/1	T/2	Q/3	OP4	R E M A R K S
21 MISSION PLANNING						
PUBLICATIONS						
22 PREFLIGHT						
23 PRETAKEOFF						
24 TAKEOFF						
25 CLIMB						
26 LEVEL-OFF						
27 CRUISE						
29 EMERGENCY PROCD.						
30 COMMUNICATIONS						
31 CREW COORDINATION						
32 DESCENT & LANDING						
33 POSTFLIGHT						
35 AIR REFUELING						
36 BOMBING						
37 GEN. NAVIGATION						
37 CEL. NAVIGATION						

"emergency print; expires 29 Apr 86"

RADAR NAV/NAV TRENDS ANALYSIS WORKSHEET

AREA	N/0	U/1	T/2	Q/3	OP4	REMARKS
37 LOW LEVEL NAV.						
46 EQUIPMENT OPERAT.						
41 GUIDED AIR MISSIL.						
43 TERRAIN AVOIDANCE						
47 JUDGEM. & COMPL.						
42 INSTRUCTOR CHECK						
42 QUALIFICATION EXAM						
17 EP EXAM CRITICAL						
17 EP EXAM [illegible]						
42 INSTRUCTOR EXAM						

Exams: 95-100= 4 85-89= 2
90-94 = 3 0 -84= 1

Key Punched

ACADEMIC EVALUATION WORKSHEET

INSTRUCTOR'S NAME:	GRADE:	ORGANIZATION:	DATE

EVALUATOR'S NAME:	GRADE:	LESSON CODE:	

OVERALL PERFORMANCE: ☐ EXCELLENT ☐ SATISFACTORY ☐ MARGINAL ☐ UNSATISFACTORY

EVALUATOR INSTRUCTIONS: This form is designed to provide an evaluation of the individual academic instructor and his lesson of instruction. Prior to the evaluation, the evaluator must review the course book, instructor guide and the list of education and training requirements (ETR's) for the lesson to be monitored. The objectives must be met, the instructor guide must be followed, and all ETR's must be covered. The grade will be either YES or NO. For all areas marked NO, please explain fully in the remarks section. Evaluate the entire lesson, if one of the graded sub-areas does not apply put N/A under the YES column. A grade of YES indicates that the evaluated item meets standards conducive to good student learning. A grade NO by any asterisked item will necessitate an unsatisfactory grade in overall performance. If, in the opinion of the evaluator the lesson was not up to the caliber conducive to student learning, the evaluator must award an overall grade of Unsatisfactory even though no asterisked areas were graded NO.

SECTION I METHOD OF INSTRUCTION: (✓ each type of media used and complete the corresponding checklists.)

Lecture	
Seminar	
Trainers - PTT, CFT, CPT, SIMS, WST	
Audio-Visual - Sound Slide, Vidiotape	
Lesson Text	
Field Trip	

SECTION II GRADING AREAS CHECKLIST

		YES	NO
A.	Lecture or Seminar		
	1. Classroom - appearance, no distractions, lighting, comfortable temperature		
	2. Training Materials - available, prechecked, current, effective		
	3. Organization - attention, motivation, overview, sequence, review		
	4. Platform Characteristics - appearance, mannerisms, confidence		
	5. Teaching Techniques - student centered, interest level, class control *		
	6. Lesson Requirements - ETR's covered, objectives met *		
	7. Time Control - Start and end, allocation		
	8. Evaluation - questioning techniques, grading, criterion tests used *		

		YES	NO
B.	Trainers		
	1. Condition - clean, available, working order, current, realism		
	2. Instructor Guide - currency, adequacy		
	3. Training Materials - available, current, effective *		
	4. Introduction - pre-brief, attention, motivation, review, preview		
	5. Instructor Characteristics - appearance, mannerisms, confidence		
	6. Instructor Knowledge - material, trainer, console *		
	7. Organization - sequence, transitions, interest level *		
	8. Lesson Requirements - objectives met, ETR's covered *		
	9. Time Control - start and end, allocation		
	10. Evaluation - techniques, grading, criterion tests used *		
	11. Conclusion - summary, assignment, remotivation		

C. Audio-Visual – Title _____		YES	NO
1. Issue Point – available, knowledgeable, appearance, courteous			
2. Learning Area – appearance, distractions, lighting, temperature			
3. Equipment – available, clean, operating condition			
4. Content – directions, narration, visuals, pace, current, interest			
5. Organization – attention, motivation, overview, review, effectiveness			
6. Evaluation – exercises, criterion tests	*		
7. Lesson Requirements – ETR's covered, objective met	*		
8. Instructor – available, knowledgeable	*		

D. Lesson Text		YES	NO
1. Training Materials – available, current, effective, accurate	*		
2. Lesson Requirements – ETR's covered, objectives met			
3. Evaluation – criterion test used, graded, discussed	*		
4. Instructor – available, knowledgeable	*		

E. Field Trip		YES	NO
1. Transportation – on time, condition			
2. Training Materials – available, condition	*		
3. Training Conditions – distractions, lighting, temperature			
4. Teaching Techniques – student centered, interest level, class control	*		
5. Lesson Requirements – ETR's covered, objectives met	*		
6. Time Control – start and end, allocation			
7. Evaluation – questioning techniques, criterion tests used	*		

SECTION III: REMARKS RECOMMENDATIONS

SIGNATURE OF EVALUATOR:	SIGNATURE OF INSTRUCTOR:

SECTION IV: CORRECTIVE ACTION

[ ] NONE REQUIRED (Signature in Section IV is required only if there is a grade of UNSAT.)

DATE	SIGNATURE OF SQ OR DIVISION COMMANDER:	SIGNATURE OF CRB CHAIRMAN:

0625 a

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 93D BOMBARDMENT WING (SAC)
CASTLE AIR FORCE BASE, CA 95342

REPLY TO
ATTN OF: DOV

SUBJECT: Training Device Evaluation

TO: 93 BMW/DO-2
93 BMW/DOD
93 BMW/DOT
93 BMW/MAAD
93 BMW/DOV(B/T)
IN TURN

1. The following training syllabus was evaluated on _____.

   a. Training Device _____. Serial Number _____.

   b. Type of mission _____.

2. The following areas were found to be:	SAT	UNSAT
a. Quality of instruction:	___	___
b. Lesson technical accuracy	___	___
c. Lesson Content	___	___
d. Training Material Quality	___	___

3. Remarks: _____

_____

_____

_____

_____

_____

4. The next evaluation will be made not later than _____.
(date)

_____
(Evaluator's Signature)

_____
Evaluator's printed name and rank

RECOMMENDATION FOR TRAINING IMPROVEMENT

To:	Originator (Name/Grade)	Organization	Office Symbol	Duty Phone	Unit of Instruction
93 BMW/DOS					

I. Originator's Suggestion/Comments:

(Continue on separate sheet)

Sign:	Duty Title:	Date:	ISD Rep Coord:

II. CDM/OPR Assessment: ☐ Concur Est Time To Complete: ☐ Nonconcur

(Continue on separate sheet)

Sign:	Duty Title:	Date:

III. DOS Action: ☐ Concur ☐ Nonconcur ☐ Recommend CRC/CRB Approval

Sign:	Duty Title: Chief, ISD Division	Date:

IV. A. CRC Action:	☐ Concur	☐ Nonconcur	Date:	Recorder's Signature:	
B. CRB Action:	☐ Concur	☐ Nonconcur	Date:	Recorder's Signature:	
V. A. Est Comp Date:	Sign:			Duty Title:	
B. Implemented (Date):	Sign:			Duty Title:	

CASTLE Form 211 (Reverse) MAR 86

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